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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,139	03/06/2007	Shinichiro Yamada	09792909-6492	2702

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EXAMINER	
LEE, DORIS L	
ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
09/01/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,139	YAMADA ET AL.	
	Examiner	Art Unit	
	Doris L. Lee	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 10-23* is/are pending in the application.

4a) Of the above claim(s) *13-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-7 and 10-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03252010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 25, 2010 has been entered.

Claim Objections

2. **Claim 2** is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It is noted that claim 2 indicates that the species which are listed as possible polysaccharides are broader than those listed in claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-7 and 10-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yamada et al (JP 2003-192925, see English language equivalent 2005/0143502)** in view of **Tanaka et al (US 5,693,786)** and **Yoshida (US 2002/0151631)**.

Regarding claim 1, Yamada teaches a resin composition ([0002]) comprising:

- at least one biodegradable polysaccharide ([0030]) which can be a starch ([0032])
- a flame retardant additive containing a hydroxide ([0043]) which is used in an amount from 5 to 50% by weight ([0048])
- and a hydrolysis suppressing agent suppressing the hydrolysis of said at least one polysaccharide ([0049]).

Yamada teaches that a nitrogen flame retardant compound can be used in the composition; however, Yamada fails to teach a) the addition of a nitrogen oxide compound. Yamada also fails to teach b) that the biodegradable starch is an esterified starch.

Regarding a) above, Yoshida teaches a resin composition ([0008]) which has a metal hydroxide component which may be aluminum hydroxide, magnesium hydroxide, or calcium hydroxide ([0018]) which incorporates a nitrogen oxide composition ([0009]). Yoshida further teaches that the nitrogen compound is used in an amount from 0.1 to 50 weight parts and the hydroxyl-group-containing compound is used in an amount from 10 to 100 parts by weight ([0033]).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the amount of nitrogen oxide compounds of Yoshida into the composition of Yamada. One would have been motivated to in order to have excellent flame retardancy at a low amount of addition to the resin without degrading various properties of such resin and a low production of combustion residue when such resin of so is combusted for disposal (Yoshida, [0007]). They are combinable because they are both concerned with the same field of endeavor, namely resins with metal hydroxides as flame retardants. Absent objective evidence to the contrary and based upon the teachings of the prior art, there would have been a reasonable expectation of success.

Regarding b) above, Tanaka teaches a biodegradable plastic resin (col. 6, lines 20-25) which is an esterified starch (col. 2, lines 20-35).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the esterified starch of Tanaka as the polysaccharide of Yamada. One would have been motivated to do so in order to receive the expected benefit of using a resin which has good flexibility, toughness and water-related properties for practical use (Tanaka, col. 1, lines 42-47). They are combinable because they are concerned with the same field of endeavor, namely biodegradable starches.

Regarding claim 2, Yamada teaches that the polysaccharide is cellulose, starch, chitosan, dextran and derivatives thereof and copolymers comprising one of them ([0032]).

Regarding claim 3, Yamada teaches that the said hydroxide includes at least one metal hydroxide ([0038]).

Regarding claim 4, Yamada teaches that the metal hydroxide is aluminum hydroxide, magnesium hydroxide or calcium hydroxide ([0038]).

Regarding claim 5, Yamada teaches that the hydroxide has a purity of not less than 99.5% ([0045]).

Regarding claim 6, Yamada teaches that said hydroxide is in the form of particles with a BET specific surface area not higher than 5.0 m2/g ([0047]).

Regarding claim 7, Yamada teaches that said hydroxide has an average particle size not higher than 100 microns ([0046]).

Regarding claim 10, modified Yamada teaches that the nitrogen oxide is a non-metallic nitric acid compound and/or a non-metallic nitrous acid compound (Yoshida, [0012]).

Regarding claim 11, modified Yamada teaches that the average particle size of said nitrogen compound is not larger that 100 microns (Yoshida, [0011]).

Regarding claim 12, Yamada teaches that the hydrolysis suppressing agent is a carbodiimide compound, and isocyanate compound or an oxazoline compound ([0050]).

Response to Arguments

5. Applicant's arguments filed February 25, 2010 have been fully considered but they are not persuasive for the reasons set forth below:

Applicant's argument: Neither Yamada nor Yoshida teach or suggest a biodegradable resin composition that includes a biodegradable polysaccharide containing at least one of acetyl cellulose and esterified starch.

Examiner's response: *This has been remedied with the additional secondary reference, Tanaka.*

Applicant's argument: Each of the cited references exhibit flame retardant properties of only UL94V-2. Clearly, the embodiment of the claimed invention achieves unexpected results.

Examiner's response: *The examiner has considered the applicant's argument of unexpected results. It is first noted that the rejection is based on a combination of references and as such, the data which the applicant refers to in Yoshida where the UL-94 is V-2, is not the composition which results from the combination of the three prior art references. It is also noted that even if the data from Yoshida were taken into consideration, it is not a proper side-by-side comparison to the data presented in the present specification because most of the nitrate compounds used in Yoshida are not ammonium nitrate. The one example which uses ammonium nitrate (Example 6 in Table 1) does not have a corresponding data point which uses the same ratio of ammonium nitrate with aluminum hydroxide to make a definitive comparison. It is also noted that the data presented in the specification is not commensurate in scope with the claimed invention. For example, the claim does not specifically recite an amount for the hydrolysis suppressing agent. The data presented only shows inventive examples which have 10 parts by weight of the hydrolysis suppressing agent. Does the desired*

flame retardant property remain at very high and very low loadings? There is no data to show that the unexpected flame retardant properties are apparent all these different loadings. It is also noted that the nitrogen oxide and the hydroxide compounds are very broadly claimed in the independent claim; however, the only types of these compounds used in the data are aluminum hydroxide and ammonium nitrate. What about all the other numerous types of nitrogen oxide compounds and hydroxide compounds? Thus, the argument of unexpected results is not persuasive.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Doris L. Lee whose telephone number is (571)270-3872. The examiner can normally be reached on Monday - Thursday 7:30 am to 5 pm and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Doris L Lee/
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796